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LAW OFFICE OF DAVID MCEWING
P.O. BOX 231324
HOUSTON, TX 77023

EXAMINER	
MAKI, STEVEN D	

ART UNIT	PAPER NUMBER
1733	

DATE MAILED: 02/18/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/588,407	BLACKMORE ET AL.	
	Examiner	Art Unit	
	Steven D. Maki	1733	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 December 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-16 and 18-51* is/are pending in the application.

4a) Of the above claim(s) *7-11,23-25* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6,12-16,20-22 and 26-51* is/are rejected.

7)☒ Claim(s) *18 and 19* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

1) The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2) Claims 26-28, 33, 35, 36-45 and 50 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

As to claims 26 and 50, it is unclear in what the ports are located. Furthermore, the description of at least one port for inflation and deflation of the seamless closed body is confusing. If the closed body has an air port extending through the cylindrical shape, then body is no longer closed.

In claims 33 and 35, there is no antecedent basis for "said carbon fibers". Should claims 33 and 35 depend on claim 32 instead of claim 29?

In claims 36 and 44, the size of the Markush group is unclear since it does not include "and" (it is not in the format of selected from the group consisting of A, B and C).

In claim 36, the double recitation of "heat curable resin" is confusing and makes it unclear if more than one heat curable resin is being described. In claim 36 line 2, it is suggested to delete --supporting a heat curable resin--.

In claims 40 and 41, there is no antecedent basis for "the braided fibers". Should claims 40 and 41 depend on claim 39 instead of claim 38.

In claim 44, there is no antecedent basis for "the non-ferrous heating element". In claim 44, should --non-ferrous-- on line 5 be deleted?

3) The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the

art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4) Claims 26-47 and 50-52 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

As to claims 26-47 and 50-52, the subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention (i.e. the new matter) is the subject matter of:

(1) the body being a seamless closed body (claims 26 and 50);

(2) the fibers being non crimped (claims 29, 46);

(3) carbon fibers in the form of a non-crimped tape (claim 35).

(4) the twenty six member Markush Group (lines 5-19 of claims 36 and 44);

As to closed, the disclosed composite is not a seamless closed body since it has open ends as shown in figure 4.

As to the fibers being non crimped (a negative limitation), there is no explicit disclosure of the fibers being non-crimped in the disclosure. It is acknowledged that the original disclosure teaches carbon fibers and graphite fibers. See specification at page 5 line 15.and page 7 line 25. It is also acknowledged that the original disclosure uses the term "filament" as an alternative to the term "fibers". See page 17 line 25. However, the original disclosure does not address the issue of crimping and as such it is not seen

how the original disclosure shows that applicant had possession of "non crimped" subject matter. Furthermore, the disclosure of winding the fibers, braiding the fibers, arranging the fibers in tows, providing the fibers in the form of a non-woven tape is consistent with the starting / supply fibers being crimped or non-crimped and consequently cannot provide direction to select "non crimped" fibers / filaments.

As to the tape being non-crimped, the original disclosure's broad description of forming the fibers in a non-woven tape does not reasonably convey the more limited subject matter of a non-crimped tape.

As to the twenty six member Markush group, the original disclosure fails to reasonably convey *all* the members of the Markush group, which has no explicit basis in the original disclosure. For example, the original disclosure describes winding and braiding instead of weaving and stitch bonding. A woven fabric does not require braiding and the original disclosure fails to teach weaving instead of braiding. As to stitch bonding, the removably attaching by sewing the prepreg is not a step of forming a composite having stitch bonded fibers. Attaching a prepreg to a bladder using sewing and forming stitch bonded fibers are different concepts. The first relates to connecting the prepreg to the bladder whereas the second relates to connecting the fibers to each other. Another example, the original disclosure does not reasonably convey using "non-crimped" fibers and filaments for the reasons given above. Another example, the original disclosure does not supporting mixing and matching crimped fibers / filaments with fibers / filaments which are not required to be crimped so as to support for example "crimped fibers containing carbon filaments".

With respect to the various definitions described by applicant in the response dated 12-2-04, the original disclosure fails to describe or incorporate by reference those definitions (e.g. the definitions for weave and stitch bonding).

In conclusion, the above noted claims, especially claims 36 and 44, are redefining the invention in a manner not contemplated by applicant at the time of filing of this application.

5) The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required:

Incorporation of the description found in claim 18 into the specification. Support is found in original claim 18 at lines 1-3 of page 18 of the original disclosure.

Incorporation of the description of the non-ferrous heating element being carbon filaments or graphite filaments. Support in the original disclosure is found at page 5 line 15, page 7 line 25, page 17 line 26, abstract page 25; the original disclosure reasonably conveying using carbon fibers, graphite fibers, carbon filaments or graphite filaments.

6) The disclosure is objected to because of the following informalities:

The continuing data at page 1 lines 12-15 should be inserted before the first sentence on page 1.

The abstract is too long and should be one paragraph. It is suggested to delete the last seven lines of the abstract.

Appropriate correction is required.

7) The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Davies

8) **Claims 1, 3-6, 21 and 29, 32-35 and 46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Davies (US 5259901) in view of Hollingsworth (US 5266137).**

Davis et al discloses an inflatable mandrel (inflatable bladder) comprising a cured matrix material such as silicone elastomer or a urethane elastomer and reinforcement fiber wherein the fiber is incorporated in the elastomer using hoop winding, helical winding and/or polar winding. The reinforcing fiber may be a graphite fiber (graphite fibers being non-metallic fibers and having the property of being electrically conductive). See col. 7 lines 47-50. Claims 1 and 21 contain a product by process limitation. In claim 1, for example, the product by process limitation is "said flexible matrix being cured to a stable elastomeric state by electric resistive heating of said fibers". This product by process language fails to require structure not shown by Davis et al. See MPEP 2113. In any event: It would have been obvious to provide the inflatable mandrel of Davis et al so as to satisfy ""said flexible matrix being cured to a stable elastomeric state by electric resistive heating of said fibers" (emphasis added) since Davis et al, which teaches using fibers such as graphite fibers, teaches curing the

matrix material (e.g. the silicone elastomer) using an autoclave. Davis does not recite using electrical cable lines to connect the fibers to an energy source.

As to claims 1, 3 and 21, it would have been obvious to one of ordinary skill in the art to use cable lines to connect the fibers (carbon fibers) of the inflatable mandrel of Davies et al to an electrical energy source so that the inflatable bladder can be heated by resistive heating and thereby cure the composite material during the use of the inflatable bladder in composite manufacture since (a) Davies et al teaches using the inflatable mandrel including wound fibers in composite manufacture in which the composite is cured and (b) Hollingsworth, also directed to using a mandrel in composite manufacture, suggests supplying heat for curing composite material on a mandrel using resistive heating wherein carbon fibers may be used as the resistance heating elements (columns 9,10). Hence, Davies et al and Hollingsworth teach *curing composite material on a mandrel.* Hollingsworth adds to the disclosure of Davies et al by teaching to *use electrical resistance elements such as carbon fibers to supply heat for curing the composite material.* One of ordinary skill in the art would have been motivated to use electrically conductive fibers (carbon fibers) as the fibers in Davies et al's mandrel to obtain the benefit of providing a heating means, which allows Davies et al inflatable mandrel / bladder to be used in composite manufacture process in which heating is used during curing.

As to "generally hollow inflation chamber", Davies et al's inflatable mandrel defines a "generally hollow inflation chamber" since it is inflatable / collapsible.

As to claims 4-6 and 21, note Davis et al's teachings regarding the reinforcing fiber. In any event: The limitation of the fibers being at ± 45 degrees (claim 4) / the 50-90% coverage (claim 5) would have been obvious in view of Davis et al's teaching that the fiber is incorporated in the elastomer using hoop winding, helical winding and/or polar winding. The limitation of the fibers being in the form of tows or bundles (claim 5) or the fibers being in the form of non-woven tape (claim 6) would have been obvious since (a) Davis et al teaches the use of reinforcing fibers and (b) it is taken as well known / conventional per se in the composite art to wind fibers which are in the form of tows, bundles, or non-woven tape.

As to new claims 29, 32-35 and 46, it would have been obvious to use "non-crimped" fibers as claimed in the inflatable mandrel of Davies et al in view of Davies et al's teaching to *filament wind fibers* which do not stretch too much (col. 7 lines 46-55). As to the fibers being carbon fibers, note the suggestion from Hollingsworth that electrical resistive heating elements include carbon fibers.

9) **Claims 2 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Davis et al in view of Hollingsworth as applied above and further in view of Europe '761 (EP 432761), Guenthner et al (US 5,216,085) or Rianda (US 4,792,374).**

As to claims 2 and 31, it would have been obvious to use fluorosilicone or fluorocarbon for the matrix of the bladder (inflatable mandrel) of Davis et al in view of Europe '761, Guenthner et al or Rianda – Europe '761 suggesting use of fluorosilicone for a bladder, Guenthner et al suggesting the use of fluorocarbon for a bladder and Rianda suggesting the use of fluorosilicone for a bladder.

10) **Claims 30 and 47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Davis et al in view of Hollingsworth as applied above and further in view of Renaud (US 4861634).**

As to claims 30 and 47, it would have been obvious to one of ordinary skill in the art to monitor and control the heating as claimed since Renaud, also disclosing electrical resistive heating, teaches maintaining temperature at a desired temperature (during hardening of resin) by determining the temperature and controlling the temperature using a means for controlling temperature connected to the ends of the resistive heating elements (wires). See col. 5 lines 65-68.

Japan '334

11) **Claims 1-3, 6, 12-13, 26-27, 36, 38, 50 and 52 are rejected under 35 U.S.C. 103(a) as being unpatentable over Japan '334 (JP 2-150334) in view of Japan '161 (JP 6-234161) or Japan '323 (JP 2-158323) and further in view of at least one of Wood et al (US 5706861), Hollingsworth (US 5266137) and Guenthner et al (US 5216085).**

Japan '334, directed to insitu pipe repair, discloses an apparatus for repairing a pipe using a repairing sleeve having curable adhesive comprising:

- an **inflatable heating device** comprising a cylindrical cloth and an expandable air tight layer;
- a pressurized fluid conduit 11 and a hole 10 for inflating the cloth and air tight expandable layer;

- an electric current feeding device, electrical wire 9 and metallic tapes 8, 8' to supply current to the cloth 7 so that the cloth 7 generates heat.

The air tight layer may be elastic resin or rubber. On both ends of the cylindrical cloth, metallic tape 8,8' are wrapped around and fixated to the outer periphery. These metallic tapes have electricity fed to them from a power feeding device via power lines 9. The cloth (fabric) may comprise threads such as crimped polyethylene terephthalate threads wherein the threads are coated with or contain conductive carbon particles. Hence: **Japan '334 discloses resistively heating an inflatable heating device for insitu pipe repair using electrically conductive non-metallic threads and thereby substantially discloses the claimed invention.** Japan '334 does not recite *embedding* the electrically conductive fibers nonmetallic in the expandable body.

As to claims 1 and 12, it would have been obvious to one of ordinary skill in the art to **embed** the electrically conductive non-metallic fibers, which are to be resistively heated, in the expandable layer of Japan '334's inflatable heating device (device for heating lining material for pipe repair) in view of (1) Japan '161's teaching to **embed** an electrically conductive element, which is to be resistively heated, in an expansion tube (device for heating lining material for a pipe) or (2) Japan '323's teaching to **embed** electrically conductive wires, which are to be resistively heated, in a heater tube (device for heating lining material of a pipe) comprising a film 4 and a tube 2. Japan '334, Japan '161 and Japan '323 are in the same field of endeavor - lining / repairing a pipe and share the common subject matter of supplying heat during repair / lining of a pipeline using resistive heating.

As to generally hollow inflation chamber, Japan '334's generally cylindrical inflatable heating device defines a "generally hollow" inflation chamber (best seen in figure 4). In any event: it would have been obvious to one of ordinary skill in the art to mount Japan '334's inflatable heating device (4, 6, 7) on a first end piece and a second end piece so as to define a "generally hollow" inflation chamber since Japan '334 teaches mounting a first end and a second end of an inflatable heating device having an air tight layer so as to form an air tight space 4' and shows that an inflatable device mounted to a first end piece and second end piece may define a relatively large space so as to be "generally hollow" (see figure 6).

As to the matrix, one of ordinary skill in the art would readily understand that the rubber described by Japan '334 for the flexible expandable body 4 is a cured elastomer. In any event: it would have been obvious to one of ordinary skill in the art to use an cured elastomeric / thermoset resin matrix such as silicone for Japan '334's bladder since cured elastomeric / thermoset resin matrix such as silicone matrix is a well known / conventional material per se for an inflatable bladder as evidenced by at least one of Wood et al (silicone at col. 4), Hollingsworth (silicone at col. 9), and Guenthner et al (fluorocarbon at abstract, col. 2). In other words, the use of cured elastomeric / thermoset resin for the bladder is suggested by and is nothing more than the use of the usual material used for bladders as evidenced by at least one of Wood et al, Hollingsworth and Guenthner et al. Wood et al specifically teaches the use of silicone for a bladder used in the art of lining / repairing pipes. Hollingsworth contains the

additional teaching of the use of carbon fibers for resistive heating. Guenthner et al suggests the specific material set forth in claims 2 and 13.

As to product by process language (claim 1), the product by process limitation of "said flexible matrix being cured to a stable elastomeric state by electric resistive heating of said fibers" fails to require structure (composition / state of cure) not suggested by the at least one of Wood et al, Hollingsworth and Guenthner et al. In other words, each of these secondary references suggest cured material for a bladder.

As to the electrical cable lines (claim 1), this subject matter is suggested by Japan '334 which suggests supplying current to the opposite ends of the conductive cloth using wires.

As to claim 2, it would have been obvious to use fluorocarbon for the matrix of the bladder in view of Guenthner et al's suggestion to use fluorocarbon for a bladder.

As to claim 3, it would have been obvious to use carbon fibers in Japan '334's inflatable heating device since Hollingsworth, directed to a mandrel having an inflatable support (bladder), teaches that **carbon fibers** may used as resistance heating elements (column 10).

As to claim 6, it would have been obvious to provide the fibers in the form of a non-woven tape since (a) Japan '334 suggests using fibers and (b) fibers in the form of non-woven tape for use for example in a woven cloth are taken as well known / conventional per se.

As to claim 12, the limitation of the claimed air port and a vacuum port would have been obvious in view of (a) Japan '334 teaching to use a pressurized fluid conduit

to supply pressurized fluid and to discharge pressurized fluid and (b) it is taken as well known / conventional in the lining art to provide an air port for communication with a compressed air source for inflating a bladder and a separate vacuum port for communicating with a vacuum source for deflating the bladder.

As to claim 13, it would have been obvious to use fluorocarbon for the matrix of the bladder in view of Guenthner et al's suggestion to use fluorocarbon for a bladder.

As to new claims 26-27, 36, 38, 50 and 52, the applied prior art is applied as above. As to the additional features: Japan '334 suggests locating the fibers substantially throughout since the cloth extends from one end to the other end. As to seamless and closed, note that Japan '334's inflatable heating device forms an air tight space 4'. As to carbon fibers, note the suggestion from Hollingsworth that electrical resistive heating elements include carbon fibers. As to crimping, Japan '334 suggests using crimped fibers. As to sized to contact, see size of inflatable heating device in figure 3.

12) **Claims 28, 37 and 51 are rejected under 35 U.S.C. 103(a) as being unpatentable over Japan '334 in view of Japan '161 or Japan '323 and further in view of at least one of Wood et al, Hollingsworth and Guenthner et al as applied above and further in view of Renaud (US 4861634).**

As to claims 28, 37 and 51, it would have been obvious to one of ordinary skill in the art to monitor and control the heating as claimed since Renaud, also disclosing electrical resistive heating, teaches maintaining temperature at a desired temperature (during hardening of resin) by determining the temperature and controlling the

temperature using a means for controlling temperature connected to the ends of the resistive heating elements (wires). See for example col. 5 lines 65-68.

13) **Claims 4-5, 14-16, 21 and 39-41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Japan '334 in view of Japan '161 or Japan '323 and further in view of at least one of Wood et al, Hollingsworth and Guenthner et al as applied above and further Baker et al (US 4191383) and optionally Rankin (US 1362351) and Renaud (US 4861634).**

As to claims 4-5, 14-16, 21 and 39-41, it would have been obvious to provide the electrically conductive fibers in the bladder as braided fibers since in view of Baker et al's suggestion to use braided material in a bladder which like that of Japan '334 is inflatable. *Claims 4-5 and 21 read on the fibers being braided since they recite fibers being helically arranged instead of being filament wound fibers.*

It is noted that claims 14-16 and 18-19 fail to require the temperature tolerant fiber windings and the electrically conductive fiber windings to comprise different materials. In any event: it would have been obvious to one of ordinary skill in the art to use temperature tolerant fibers and electrically conductive fibers in view of (a) Renaud's teaching to one of ordinary skill in the pipelining / pipe repairing art to use a combination of reinforcing fibers such as glass fibers and conductive wires for resistively heating in a lining material and (b) Rankin's teaching to use non-conducting filaments with a conductor in a heating element which is to be resistively heated.

14) **Claims 20, 22, 44 and 48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Japan '334 in view of Japan '161 or Japan '323 and further in**

view of at least one of Wood et al, Hollingsworth and Guenthner et al as applied above and further in view of Lippiatt (US 5,199,463).

As to claims 20, 22, 44 and 48, it would have been obvious to removably attach a pre preg comprising fibers and thermosetting resin since Lippiatt, also directed to repairing pipelines, suggests removably attaching lining material in the form of a pre-preg (fibrous material impregnated with heat curable resin) to a bladder using loose ties.

15) **Claims 45 and 49 are rejected under 35 U.S.C. 103(a) as being unpatentable over Japan '334 in view of Japan '161 or Japan '323 and further in view of at least one of Wood et al, Hollingsworth and Guenthner et al and further in view of Lippiatt as applied above and further in view of Renaud (US 4861634).**

As to claims 45 and 49, it would have been obvious to one of ordinary skill in the art to monitor and control the heating as claimed since Renaud, also disclosing electrical resistive heating, teaches maintaining temperature at a desired temperature (during hardening of resin) by determining the temperature and controlling the temperature using a means for controlling temperature connected to the ends of the resistive heating elements (wires). See for example col. 5 lines 65-68.

Allowable Subject Matter

16) **Claims 18 and 19 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.**

Claims 42 and 43 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112 set forth in this Office action.

Claim 20 would be allowable if amended to include all of the limitations of claims 12 and 18.

Claim 18 (dependent on claim 12) and claim 42 (dependent on claim 36) recite the additional limitation of "the heating element includes a plurality of filament wound fibers".

When considered as a whole, the combination of Davies et al and Hollingsworth fail to suggest "An apparatus for curing a prepreg repair material supporting a heat curable resin for in-situ repair of a conduit" as set forth in the combination of claims 12 and 18 or "An apparatus for curing a heat curable resin of a pre-preg repair material [supporting a heat curable resin] for in-situ repair of a conduit" as set forth in the combination of claims 36 and 42.

When considered as a whole, there is no suggestion to combine Davies et al and Japan '334 since (1) Davies et al is directed to manufacturing composite articles by methods such as filament winding, braiding, tape rolling, hand lay-up and resin transfer molding whereas Japan '334 is directed to a device for repairing pipeline partially from inside, (2) Davis et al teaches filament wound fibers but not electrical resistive heating, and (3) Japan '334 teaches electrically resistive heating of a woven or knitted fabric comprising crimped threads, but not filament wound fibers.

Furthermore, Japan '334's teaching of a woven or knitted fabric comprising crimped threads and Baker et al's teaching of braided reinforcement fails to suggest modifying Japan '334 such that the resulting inflatable heating device comprises "the

heating element includes a plurality of filament wound fibers" (emphasis added) instead of woven fibers, knitted fibers or braided fibers.

Remarks

17) Applicant's arguments filed 12-2-04, 8-6-04 and 4-9-04 have been fully considered but they are not persuasive.

Applicant's election of Group I in the reply filed on 4-9-04 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)). Applicant comments that claims 21 and 22 should be part of the elected group rather than claim 20. Examiner comments that claims 20-22 are part of the elected group and adds the following comments for clarification: Claims 7-11 and 23-25 remain withdrawn from considered as being directed to a non-elected invention. Unlike claims 1-6, 12-16, 18-22 and 26-51, each of these withdrawn claims require the subject matter of a *method step of using electrical resistive heating to cure the material of the inflatable device / cylindrical body* (in contrast using electrical resistive heating to cure *a prepreg* on the inflatable device / cylindrical body).

With respect to Davies et al, Applicant argues that Davis does not suggest using any fibers having electrical properties. Applicant is incorrect since Davies et al teaches using graphite fibers, which are electrically conductive fibers.

Applicant's argument that Davies et al teaches away from the invention by teaching use of fibers for mechanical strength in contrast to electrical conductivity is not

persuasive since Davies et al teaches that graphite fibers (electrically conductive fibers) may be used in the inflatable mandrel.

Applicant's argument that Davies et al teaches away from the invention by teaching the use of Kevlar fibers with silicone elastomers is not persuasive since Davies et al teaches that graphite fibers (electrically conductive fibers) may be used in the inflatable mandrel.

Applicant's argument that Davies et al teaches away from the invention by teaching the use of bagging and autoclaving technology as the method of curing the elastomer of the bladder is not commensurate in scope with the claims and is therefore not persuasive. All of the elected claims read on a bladder having a matrix cured by bagging and autoclaving technology. None of the elected claims require a *method step of using electrical resistive heating to cure the material of the inflatable device / cylindrical body*.

Applicant argues that Hollingsworth's mandrel is used in a dramatically different application. The examiner disagrees. Hollingsworth's mandrel, like Davies et al's mandrel, is used for composite manufacture.

Applicant's remaining arguments regarding Hollingsworth are not persuasive since (1) Davies et al and Hollingsworth teach curing composite material on a mandrel, (2) the mandrel of Davies et al may comprise electrically conductive fibers (graphite fibers) and (3) Hollingsworth suggests supplying heat for curing of composite material by resistively heating electrically conductive fibers. Where are the fibers in Davies mandrel? Answer: the fibers are embedded in the cured elastomeric material.

With respect to Japan '334, applicant's argument that a polyethylene terephthalate thread coated with carbon powder will not posses the mechanical properties of carbon or graphite fibers combined with flexibility and compatibility to silicone elastomers. The argument is not persuasive since "non-metallic electrically conductive fibers" (claim 1), "non-ferrous heating element" (claim 12) and "heating element" (claim 20) each read on polyethylene terephthalate thread coated with carbon powder wherein Japan '334 teaches passing electric current through this material to resistively heat.

Applicant argues that applicant's invention specifically claims use of non-metallic electrically conductive fibers with an expandable matrix. First: claims 12, 20 and 22 fail to require "non-metallic electrically conductive fibers". Claims 12 and 22 merely recite "non-ferrous heating element" (e.g copper). Claim 20 merely recite "heating element" (e.g. copper or ferrous material). Second and more importantly, **Japan '334 discloses non-metallic electrically conductive fibers for an inflatable heating device for pipe repair.** The fibers are non-metallic since they comprise polymer (polyethylene terephthalate) and carbon (but not metal). The fibers are electrically conductive due to the carbon. **The claimed "non-metallic electrically conductive fibers" read on Japan '334's conductive fibers.** The examiner concurs that Japan '334 does not teach *embedding* (the non-metallic conductive fibers for resistive heating are *on* the matrix material instead of *within* the matrix material. However, Japan '161 or Japan '334 suggest heating elements for resistive heating may be *embedded / within* matrix material instead of on matrix material; it being emphasized that the conductive fibers for

resistive heating in Japan '334 and the heating elements for resistive heating in Japan '161, Japan '323 are used for the *same* purpose - supplying heat to lining material within a pipe to cure the resin of the lining material.

Applicant asserts that the prior art does not provide any expectation of success of the reliable and robust properties taught by applicant's invention. This argument is not commensurate in scope with the claims. None of the claims require the inflatable heating device to have "reliable and robust properties".

18) Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

19) Any inquiry concerning this communication or earlier communications from the examiner should be directed to Steven D. Maki whose telephone number is (571) 272-1221. The examiner can normally be reached on Mon. - Fri. 7:30 AM - 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Blaine Copenheaver can be reached on (571) 272-1156. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Steven D. Maki
February 18, 2005

Steven D. Maki 2-18-05
STEVEN D. MAKI
PRIMARY EXAMINER
~~GROUP 1300~~
AU 1733